Solid solutions in a fluid world

Nijhuis Industries delivers ‘solid solutions in a fluid world’ as a response towards a greener economy. To accommodate the customer requirements, Nijhuis offers customized installations to meet today’s challenges, as well those of the future, across a wide range of industries and municipalities in today’s ‘fluid’ world.

“Turn (waste)water into PROFIT”

We are aiming to turn (waste)water into profit with solutions for Sustainable Water Use and Resource Recovery.

It is our ambition to help customers and deliver solutions to:

- **Reduce** the environmental footprint
  - water, energy, chemicals, sludge
- **Reuse** water and heat
- **Recover** resources
  - nutrients, raw materials, biofuel, biogas, water

We help our valued customers to meet their increasingly demanding sustainability requirements, lower their environmental footprint, combine productivity and energy efficiency and reduce life cycle cost at the same time.

Nijhuis facts

- **SINCE** 1904
- **>2400** References
- **>3600m²** Production Area
- **>120** Countries Active
- **>230** Employees
- **>30** Rental Solutions
- **>50** Partners & Agents
- **>150** Realtime monitored plants
With more than 150 references in the oil, gas and mining industry, Nijhuis Industries offers BAT solutions for the removal of hydrocarbons, solids, COD, nutrients and other contamination.

- Chemical fertilizer production
- Cleaning water from storage tanks
- Mining
- Produced water
- Production of injection water
- Refinery and petrochemical tank farms
- Slop water
- Steam-assisted gravity drainage (SAGD)
- Storm water

Project Examples:

- Slop Water Treatment Unit
- Refinery Wastewater Treatment Plant
- Azomures - Wastewater Treatment Plant
We have a long-standing experience and application know-how in the food, dairy and beverage market. Our reference base includes clients from multinational to local companies across the following industries:

- Bakery
- Catering
- Convenience, ready meal and food processing
- (Craft)breweries, distilleries and wineries
- Dairy processing
- Edible oil
- Potato and chips processing
- (Instant) soft drinks, coffee and beverage producers
- Sugar
- Vegetables

Project Examples:

- Umalat - Modular Wastewater Treatment Plant
- Jacobs Douwe Egberts - Anaerobic-Aerobic Treatment Plant
- Alaska Milk - Wastewater Treatment Plant
Our unique portfolio for the municipal & sewage market consist of the supply of (waste) water and cooling water consultancy and equipment delivery, through to providing a complete integrated solution encompassing design, civil & MEICA installation/commissioning.

- Cities and sewage treatment plants
- Data- and visitor centers
- Desalination plants
- Drinking / potable water
- Flood prevention
- Holiday parks, swimming pools, hotels and airports
- Hospitals and medical residues
- Industrial zones
- Leachate treatment
- Shopping malls and furniture retailers

Project Examples:

- Horstermeer - Sewage Treatment Plant
- Furniture Retailer - Turn-key Botanical Garden Plant
- Antwerpse Water Werken - Drinking Water Treatment Plant
We have gained unparalleled knowledge in a wide range of industries, meeting or exceeding the industry standards. Every industry has its own specific (waste)water process and characteristics.

- Algae
- Biodiesel
- Cement & brick
- Chemicals
- Cosmetics and soaps
- Health and pharma
- Metals
- Plastic production and recycling
- Power plants
- Shipyards
- Textile and tanneries
- Wood, pulp and paper

Project Examples:

- Festida Foods - Wastewater Treatment Plant
- SNB (sludge treatment) - Modular DAF plant
- Cosmetics - Wastewater Reuse Plant
Nijhuis has years of experience in designing complete wastewater treatment plants and recovery of energy plants in the meat, processing and agricultural market, turning waste and wastewater into profit.

We offer (waste)water solutions in the following industries:

- Agricultural (vegetable) waste
- Biogas processing
- Digestate treatment
- Manure treatment
- Pet food production
- Rendering plants
- Red meat slaughterhouse & processing
- White meat slaughterhouse & processing

**Project Examples:**

- Cedrob S.A. - Wastewater Treatment & Biogas Plant
- Safi Sana - Waste to Value Plant
- PJSC Oril-Leader- Wastewater Treatment & Biogas Plant
We design, build, finance, operate and maintain (waste)water treatment plants to turn cost into **PROFIT** with a unique portfolio of smart and game-changing solutions in **sustainable water use** and **resource recovery**.

Nijhuis was founded in 1904 and our flexibility and customer oriented approach have been important values in our company history with more than 2400 references around the globe.
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“Turn your (waste)water into PROFIT”
Filters / screening
Filter systems are used as primary screening to separate large particles from your wastewater. Removal of these particles prevents downstream pipe blockages and protects upstream equipment.

- **NPS**: Self-cleaning channel filter Aquarake.
- **NZB**: Straightforward curved screen.
- **NTF**: Inside fed rotary drum screen.
- **NDF**: Inside fed cloth drum filter.

Flotation (i-DAF)
The Dissolved Air Flotation system is based on the Nijhuis proprietary and intelligent aeration system (i-AERATION) which forms fine air bubbles that support and increase the separation of particles. The DAF units can be supplied with several add-ons, making the unit the most intelligent DAF (i-DAF) on the planet.

- **IPF & NPF**: Compact flotation unit with plate packs.
- **GDF**: Open flotation unit for handling high sludge loadings.
- **High Rate i-DAF**: DAF applications for high capacities above 800 m³/hr / 20 MLD, executed in stainless steel or concrete.
- **DGF**: Dissolved Gas flotation using for example nitrogen-gas or biogas in the aeration system.
- **ICF(F)**: A revolutionary next generation system DAF based on a plug and play principle, available in boxframe or container set-up.
Gravity Separators
Remove heavy settling and floating particles from water without the addition of chemicals and energy.

- **NTB**: Robust and straightforward sedimentation unit / lamella settler.
- **NSS**: Sand separator to remove sand and sediment.
- **CPI**: Oil water separator in a concrete basin.
- **CCS**: Oil water separator in a stainless steel unit.
- **PPA module**: Standardized plate pack module, integrated in CPI’s.

Coagulation & Flocculation
Remove emulsions, dispersions and heavy metals from the wastewater by adding coagulant, flocculant or precipitant.

- **PFR**: Pipe flocculator, designed for effective mixing of chemicals with wastewater.
- **Mixing tanks**: Concrete or pp tank with mixer, designed for effective mixing of chemicals with wastewater.
- **CDU/FDU**: Skid mounted chemical dosing units.
- **NMA / NMM**: Flocculant make up units.
- **i-FLOC**: Intelligent flocculants which are economical to use.

Intelligent Dosing (i-DOSE)
The i-DOSE system complies to real-time dosing processes, significantly reducing wastewater chemical consumption costs up to 30% and reducing operators presence.
Aerobic Treatment (BIOCTOR)
Based on a biological process, controlled under aerobic conditions (with aeration) that effectively treats COD, BOD and VSS into water, carbon dioxide and new biomass.

- **BIOCTOR-SBR**: An easy and flexible to operate single tank solution.
- **BIOCTOR-CONTINUOUS**: Water flows by gravity through the required steps of treatment of a continuous system.
- **BIOCTOR-MBR**: A sludge water separation system by membranes, using flat plate or hollow fibre membrane modules.
- **BIOCTOR-MBBR**: The addition of carriers results in a more effective growth of bacteria, requiring a compacter aeration.

- **BIOCTOR-BOTANIC**: Biological solution which utilizes active biofilms on natural (plant) and/or engineered root structures (biomodules), all in a fully-enclosed, odorless facility, significantly reducing physical footprint in combination with Nijhuis pre-treatment and polishing solutions.

Aeration systems (FLEX-AERATION)
We offer a wide range of surface and bottom aeration solutions, resulting in flexible and custom-made configurations, providing a complete aeration package and installed into a new situation or retrofit.

- **NFA-S**: High or low speed aerators.
- **NFA-B**: Tubes or disc diffusers membranes.
Anaerobic Biological Treatment

Anaerobic Treatment (AECOMIX™)
Based on a biological process, controlled under anaerobic conditions that effectively treats COD, BOD and VSS while producing biogas, heat and very little biomass (without oxygen).

- **AECOMIX™-TAURUS**: The reactor is suitable for all types of waste, sludge and renewable energy crop based on a mixed and heated digester tank.
- **AECOMIX™-DGF**: A revolutionary and highly innovative solution, treating wastewater with high TSS and/or FOG. The concept provides a single step process solution.
- **AECOMIX™-EGSB/UASB/IR**: High-rate anaerobic technology offers high COD and BOD wastewater removals in a highly loaded anaerobic system with minimized footprint.
- **AECOMIX™-DACs**: The anaerobic reactor technology, which is one of the most complete anaerobic system, fits into any available tank on the market.

Biogas Treatment & Utilization
Biogas can be used to feed boilers, gas engines or Combined Heat & Power (CHP) installations or can be upgraded to green or natural gas and supplied to the electricity grid.

Digestate and Effluent Treatment
In order to treat the digestate/effluent after the AECOMIX™ process to discharge or reuse requirements, Nijhuis offers several polishing, reusing and recovery solutions.

For example, the digestate can be treated with separation solutions (screw press, decanter or drum filter) and effluent can be treated with aerobic biological treatment solutions (BIOCTOR) and being polished and reused with Sand Filtration (CSF), CarboPure (CP), membrane, ozone (NOS) and UV (NUV) technologies.
Polishing
For polishing wastewater to very stringent discharge consents or to optimise your process water systems.

- **Tertiary i-DAF**: DAF solution to remove phosphorous and suspended solids from a tertiary wastewater stream.
- **Continuous Sand Filter (CSF)**: A continuous sand or cloth media filter to remove suspended solids from the wastewater by filtration over a sand bed.
- **CarboPure (CP)**: Combines conventional activated carbon filtration with air dissolving technology to remove COD.
- **Comprehensive 1 step polishing (1-STEP® Filter)**: An innovative filter combining four processes in one single additional treatment unit to remove nutrients, heavy metals and micro pollutants.

- **Membrane Technologies (MF / UF / NF / EDR / RO)**: The wastewater will pass through a barrier by means of a pressure difference between the two membrane surfaces. This will keep clean water on one side of the membrane and the pollution on the other side.

**Ozone (NOS)**
Ozone (O₃) treats (waste)water chemical free to eliminate bacteria, biofilm, viruses, hormones, pesticides and pharmaceuticals and recalcitrant COD to reuse wastewater for cleaning or irrigation purposes, disinfect cooling water, disinfect pasteurization / sterilization lines and decolor water.

**UV Disinfection (NUV)**
Disinfection can be achieved by UV-C radiation, a specific light wavelength that damages the DNA structure of micro-organisms.

**Automatic Tube Cleaning (ATC)**
Provides a permanent solution to combat scaling and fouling problems for heat exchangers.
Sludge Management

Sludge disposal costs are a key component in the operational costs of wastewater and waste treatment systems. Dewatering the produced sludge can reduce the disposal costs dramatically, as the dewatered sludge can be integrated in a biogas installation to produce more biogas.

The sludge management solutions can either be integrated in the total process or offered as a single solution to maximize the value of sludge.

- **Drum Filter (NDF):** The cloth drum filter is an inside fed screen with a perforated drum covered by a cloth, specially designed for dewatering excess sludge up to 6% dry solids or as solid and liquid separation for manure.
- **Screw Press (NSP):** A sludge screw press is a flexible sludge solution, separating sludge into a liquid and a solid fraction.
- **Chamber Filter Press (NCFP):** Filter presses dewater sludge in chambers by applying very high pressures to the system.
- **Decanter Centrifuge:** A decanter centrifuge separates solids from one, two or three liquid phases in one single continuous process.
- **Belt Press:** Dewatering of sludge by a belt system, first stage by gravity, followed by a pressurized belt for further dewatering.
Resource Recovery (AECO-RECOVERY)
Advanced resource recovery solutions towards a circular ECONomy.

- **CIP Recovery (AECO-CIP):** The Nijhuis AECO-CIP recovery unit is a plug & play packaged system to treat spent CIP solutions (i.e. hot soda based). We offer modular expanded packaged plants with capacities between 0.5 to 10 m³/hr.

- **Ammonia Recovery (AECO-NAR):** Ammonia recovery solution, turning digestate or centrate water into a biobased fertilizer. The AECO-NAR has a proven ammonia removal efficiency of 80-90%.

- **Fat Recovery (AECO-FAT):** Fat recovery solution from industrial wastewater as biofuel. AECO-FAT valorizes flotation sludge into valuable products and saves sludge disposal & chemical costs.

Modular Manure Treatment (GENIUS)
Nijhuis GENIUS is a total solution for manure and turns raw manure or digestate into for example electricity, phosphate, nitrogen and potassium fertilizer and clean water. The principle of GENIUS is based on producing green minerals based on an innovative, cost saving and sustainable way and consisting of a combination of smart technologies.

The produced green minerals ensure regional balanced fertilization by dosing sufficient individual nitrogen, phosphate or potassium fertilizers for pasture land or arable crops. This will reduce the rinse of fertilizers into ground and surface water and reduces the use of the chemical fertilizers.
Consultancy (i-CONSULT):
The i-CONSULT team has extensive experience undertaking all types of (waste)water, wastewater and provide planning support, flood risk and other environmental consultancy work. We offer site audits to identify opportunities to reduce, reuse and recover (waste)water and resources.

Operation & Maintenance (i-MAINTENANCE)
We offer preventive and corrective maintenance programs, inspecting the equipment of the installation and give advice to keep the equipment at maximum performance, against the lowest total cost of ownership.

Monitoring (i-MONITORING)
We provide online monitoring (24/7) from installations around the globe supported from our global monitoring and service center in Doetinchem, the Netherlands to continuously improve the reliability of the installation.

Training / Effluent Coach (i-ACADEMY)
The i-ACADEMY training provides an experienced effluent or waste to value coach to exchange best practices from around the world and share valuable process information, tailored to the requirements of the audience.

Decentralized Control (i-CONTROL)
i-CONTROL is an intelligent cost-effective electrical control and installation method to reduce installation cost as well as the amount of cables, minimizing and shortening the installation time.

Modular (rental) solutions (MODULUTIONS)
Nijhuis MODULUTIONS are applicable to a variety of applications and technologies in compact modular units, based on a ‘plug and play’ principle. We design, build and realize MODULUTIONS in prefabricated containers, on skid or/and boxframes.